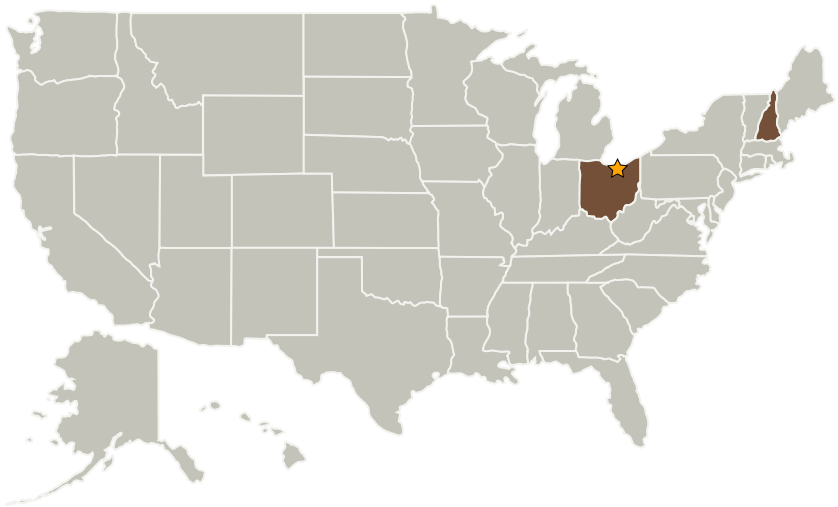
Lightweight, High-Temperature Radiator Panels, Phase II

Completed Technology Project (2004 - 2006)

Project Introduction

Lightweight, high-temperature radiators are needed for future, high-efficiency power conversion systems for Nuclear Electric Propulsion (NEP). Creare has developed flexible radiators that are extremely lightweight, stowable in small volumes, and deployable with small forces, but are limited by materials to temperatures below 350 K. These novel radiators incorporate integral micrometeorite protection. Our innovation is a material combination and fabrication method that produces radiator panels with low weight, high fin efficiency, and excellent strength at temperatures. Our goal is to provide a radiator technology based on prior technologies and provides a major advancement toward NASA's goals for light weight and high temperature operation in advanced radiators. The innovative approach does not require development of new materials, simply refinement of processes to join standard metal tubes and foils in the configuration desired. In Phase I we proved the feasibility of the concept and demonstrated the ability of the panel to operate at high temperature. Our lightweight radiator panel offers a factor of four reduction in weight compared with present honeycomb structures and will approach 1.5 kg/m? at a fin efficiency approaching 80%. During Phase II we propose to build, test, and deliver an subscale radiator that demonstrates the advantages of the technology.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Creare LLC	Supporting Organization	Industry	Hanover, New Hampshire

Primary U.S. Work Locations	
New Hampshire	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.1 Cryogenic Systems
    - TX14.1.3 Thermal Conditioning for Sensors, Instruments, and High Efficiency Electric Motors